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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/642,625	08/19/2003	Kazuya Oda	0378-0396P	3794

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EXAMINER	
CUTLER, ALBERT H	
ART UNIT	**PAPER NUMBER**
2621	

DATE MAILED: 11/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/642,625	ODA ET AL.	
	Examiner	**Art Unit**	
	Albert H. Cutler	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 19 August 2003.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-18 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-18 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 19 August 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 08/19/2003.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 08/19/2003 has been considered by the examiner.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

3. The disclosure is objected to because of the following informalities: In paragraph 0049, S1 and S2 refer to two different strokes. S1 and S2 are not found on the drawings, so S1 and S2 should be removed, or placed in appropriate places on the drawings.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-12, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagano(US Patent 7,041,950) in view of Canini(US Patent 7,053,954).

Consider claim 1, Nagano teaches:

A solid-state image pickup apparatus(Image Sensing Element) comprising:

a solid-state image sensor(10, figure 1, figure 2, column 6, lines 17-21) comprising a plurality of photosensitive cells("The image sensor is made up of several million pixels" column 6, lines 20-21) arranged in a two-dimensional array("two-dimensional area sensor with 2X2 pixels" column 6, lines 19-20) for converting incident light to electric signals(column 6, lines 52-58), each of said plurality of photosensitive cells(figures 4, 6A, and 6B) including a main region(119c) and a subregion(119a or 119b) smaller in area than said main region(When the aperture is at anything less than a full state, the effective areas of the subregions become smaller than that of the main region. See figure 6A and 6B, column 7, lines 20-34);

a shutter("vertical scanning circuit" 116, column 8, lines 48-59) for adjusting an end of an exposure time over which light incident to said solid-state image sensor is subject to photoelectric transduction(The vertical scanning circuit changes a control to

high to start the exposure, and then turns the control pulse to low to end the exposure. Column 8, lines 48-59);

and a system controller("image sensor control circuit" 21, figure 1) for controlling, in response to an image pickup operation meant for said solid-state image sensor("an image control circuit for driving and controlling the image sensor" column 5, lines 60-61)

However, Nagano does not explicitly teach of a sensitivity control circuit for comparing actual sensitivity of each of said subregions for a predetermined quantity of light with predetermined sensitivity of the subregion for the predetermined quantity of incident light to determine a sensitivity error and compensating for the sensitivity error.

In a similar field of endeavor relevant to the pertinent problem(Process of Regulating the Exposure Time of a Light Sensor, column 1, lines 7-11), Canini teaches of a sensitivity control circuit(figure 6, column 7, line 46 through column 8, line 2) for comparing actual sensitivity of each of a group of pixels for a predetermined quantity of light with predetermined sensitivity of the pixel for the predetermined quantity of incident light(A signal "Video" is proportional to the luminosity of the current pixel(i.e. an actual sensitivity value). This value is compared to a prefixed global threshold value(i.e. a predetermined sensitivity value) column 7, lines 53-59, figure 6) to determine a sensitivity error and compensating for the sensitivity error(The sensitivity control circuit(figure 6) determines if the pixel is saturated or underexposed(i.e. a sensitivity error) based on the comparison of the actual and predetermined values, and compensates by adjusting the exposure time. Column 7 line 61 through column 8, line 2).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to use the sensitivity control circuit as taught by Canini for regulating the exposure time of the sub-regions of the pixels in the digital camera taught by Nagano in order to achieve an image that is rich in details(that is, it is well exposed) and not saturated(Canini, column 2, lines 7-13).

Consider claim 2, and as applied to claim 1 above, Nagano further teaches:

each of said plurality of photosensitive cells(figures 4, 6A, and 6B) has a photosensitive area divided into the main region(119c) and the subregion(119a or 119b) different in area from each other(see figures 4, 6A, and 6B).

Consider claims 3 and 4, and as applied to claims 1 and 2 above, Nagano does not explicitly teach:

a sensitivity error detector for comparing the actual sensitivity with the predetermined sensitivity for determining the direction and an amount of the sensitivity error; and an error adjuster for adjusting the direction and the amount of the sensitivity error.

However, Canini teaches:

a sensitivity error detector(figure 6. The first comparator is the sensitivity error detector. Column 7, lines 46-57) for comparing the actual sensitivity(Video) with the predetermined sensitivity(Local threshold) for determining the direction("When the voltage at the ends of the condenser exceeds the undesired global threshold level, the

SAT (or UNDER EXP) signal is generated" This signal indicates the direction of the sensitivity error. Column 7, lines 61-66) and an amount(M values determine the amount of sensitivity error because they correspond to the maximum and minimum exposure times set. Column 5, lines 47-56, column 6, line 48 through column 7, line 18. For example, a pixel would be more likely to saturate at a longer exposure time, and saturation represents an amount of over-exposure.) of the sensitivity error;

and an error adjuster for adjusting the direction and the amount of the sensitivity error("The exposure time is regulated to find an optimum exposure time" column 5, line 66 through column 6, line 3).

Consider claims 5-8, and as applied to claims 1-4 above, Nagano teaches of a system controller and photosensitive cells segmented into main regions and subregions(see claim 1 rationale). Nagano also teaches that a "monitoring output" obtained from the main region is used to set the accumulation times of the light-receiving regions 119a and 119b(column 8, lines 12-17).

However, Nagano does not explicitly teach:

said system controller detects the sensitivity error in the direction in which the actual sensitivity becomes greater than the predetermined sensitivity and the sensitivity error in the direction which the actual sensitivity becomes smaller than the predetermined sensitivity as a positive error and a negative error, respectively, said system controller using, on detecting the positive error, an exposure time of said main region as a reference to delay a start of the exposure time of said subregion

independence upon the amount of the positive error, and using, on detecting the negative error, an exposure time of said subregion as a reference to delay the exposure time of said main region in dependence upon an amount of the negative error.

However, Canini teaches:

said system controller detects the sensitivity error in the direction in which the actual sensitivity becomes greater than the predetermined sensitivity(Overexposure, column 6, lines 11-28) and the sensitivity error in the direction which the actual sensitivity becomes smaller than the predetermined sensitivity(Underexposure, column 6, lines 29-40) as a positive error(column 6, lines 11-28) and a negative error("negative result" column 6, lines 29-40), respectively, said system controller using, on detecting the positive error, an exposure time of said main region as a reference to delay a start of the exposure time independence upon the amount of the positive error("therefore a smaller exposure time should be set" column 6, lines 19-20), and using, on detecting the negative error, an exposure time of a reference to delay the exposure time of said main region in dependence upon an amount of the negative error("a greater exposure time is set" column 6, lines 31-32)(Smaller exposure times correct positive errors and longer exposure times correct negative errors. Column 6, lines 11-40).

Consider claims 9-12, and as applied to claim 5-8 above, Nagano teaches of a system controller(see claim 1 rationale).

Conversely, Nagano does not explicitly teach of a sensitivity error adjuster.

However, Canini teaches:

said sensitivity error adjuster(see claim 3 rationale) comprises:

a timing signal generator for generating a timing signal(a "signal is generated which indicates the presence of excessive saturation(or under-exposure) in the image and, therefore, the necessity of setting a different exposure time." Column 7, lines 63-66) for causing the exposure time in dependence upon the amount of the sensitivity error to start("The process of the invention includes, advantageously, the setting of a new exposure time Tn in a period of time 'n'" column 8, lines 19-20. The previous exposure time is examined, and a new optimum exposure time Tn is set for the next period. Column 8, lines 28-37);

and a driver for feeding a drive signal to said solid-state image sensor in response to the timing signal("a new exposure time Tn is set on the sensor" column 8, line 33. This new exposure time is in response to the timing signal generated as illustrated above.).

Consider claim 15, Nagano teaches:

A method of adjusting outputs of photosensitive cells(column 3, lines 1-18) comprising:

a first step of arranging a plurality of photosensitive cells in a two-dimensional array("FIG. 2 shows a two-dimensional area sensor with 2X2 pixels(i.e. photosensitive cells" column 6, lines 17-20, figure 2) for converting incident light to electric signals(column 6, lines 52-58), each of the plurality of photosensitive cells(figure 4, 6A, 6B) including a main region(119c) and a subregion(119a or 119b) smaller in area than

the main region(When the aperture is at anything less than a full state, the effective areas of the subregions become smaller than that of the main region. See figure 6A and 6B, column 7, lines 20-34);

a third step of designating either one of the main region(119c) and the subregion(119a or 119b) as a reference region while handling the other region as a subject region to be adjusted(Nagano teaches of designating the main region, and using the output of the main region(i.e. the reference) to determine the accumulation time of the subregions(column 8, lines 13-18),

However, Nagano does not explicitly teach that the photocells are adjusted according to a sensitivity error that must be cancelled. Nagano does not explicitly teach a second step of comparing actual sensitivity of each of the subregions for a predetermined quantity of light with predetermined sensitivity of the subregion for the predetermined quantity of incident light to determine a direction and an amount of a sensitivity error. Also, Nagano does not explicitly teach a fourth step of executing processing for canceling the amount of the sensitivity error derived from the subject region in accordance with the control.

In the same field of endeavor, Canini teaches that the photocells are adjusted according to a sensitivity error that must be cancelled(column 5, line 57 through column 6, line 10).

Canini also teaches a second step(Column 7, lines 46-57, figure 6) of comparing actual sensitivity(Video) of each of the pixels for a predetermined quantity of light with predetermined sensitivity(Local threshold) of the pixels for the predetermined quantity of

incident light to determine a direction("When the voltage at the ends of the condenser exceeds the undesired global threshold level, the SAT (or UNDER EXP) signal is generated" This signal indicates the direction of the sensitivity error. Column 7, lines 61-66) and an amount(M values determine the amount of sensitivity error because they correspond to the maximum and minimum exposure times set. Column 5, lines 47-56, column 6, line 48 through column 7, line 18. For example, a pixel would be more likely to saturate at a longer exposure time, and saturation represents an amount of over-exposure.) of a sensitivity error.

Canini further teaches a fourth step of executing processing for canceling the amount of the sensitivity error derived from the subject region in accordance with the control("The exposure time is regulated to find an optimum exposure time" column 5, line 66 through column 6, line 3).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to adjust the exposure time of the photosensitive cells based on sensitivity as taught by Canini in the method for adjusting the output of photosensitive cells taught by Nagano in order to achieve an image that is rich in details(that is, it is well exposed) and not saturated(Canini, column 2, lines 7-13).

Consider claim 16, and as applied to claim 15 above, Nagano teaches using the output of the main region to control the exposure time of the subregions(see claim 15 rationale).

However, Nagano does not explicitly teach:

said third step comprises: a substep of detecting the sensitivity error in the direction in which the actual sensitivity becomes greater than the predetermined sensitivity and the sensitivity error in the direction which the actual sensitivity becomes smaller than the predetermined sensitivity as a positive error and a negative error, respectively; and a substep of using, on detecting the positive error, an exposure time of the main region as a reference to delay a start of the exposure time of the subregion in dependence upon the amount of the positive error or using, on detecting the negative error, the exposure time of the subregion as a reference to delay the exposure time of the main region in dependence upon an amount of the negative error.

Conversely, Canini teaches:

a substep of detecting the sensitivity error in the direction in which the actual sensitivity becomes greater than the predetermined sensitivity(Overexposure, column 6, lines 11-28) and the sensitivity error in the direction which the actual sensitivity becomes smaller than the predetermined sensitivity(Underexposure, column 6, lines 29-40) as a positive error(column 6, lines 11-28) and a negative error("negative result" column 6, lines 29-40), respectively;

and a substep of using, on detecting the positive error, an exposure time as a reference to delay a start of the exposure time of the pixel in dependence upon the amount of the positive error("therefore a smaller exposure time should be set" column 6, lines 19-20) or using, on detecting the negative error, the exposure time as a reference to delay the exposure time of the pixel in dependence upon an amount of the negative error("a greater exposure time is set" column 6, lines 31-32)(Smaller exposure times

correct positive errors and longer exposure times correct negative errors. Column 6, lines 11-40).

7. Claims 13, 14, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagano in view of Canini as applied to claims 4 and 15 above, and further in view of Gaylord(US Patent 6,628,334).

Consider claims 13 and 17, and as applied to claims 4 and 15 above, the combined invention of Nagano and Canini teaches of a system controller(see claim 1 rationale), and of dividing the pixel area into main and subregions(see claim 1 rationale).

However, the combined invention of Nagano and Canini does not explicitly teach that the system controller amplifies the signal output from said subregion when the negative error is detected.

In the same field of endeavor(Improving Image Signals, paragraph 0001), Gaylord teaches:

The system controller amplifies a signal output when the negative error is detected(Gaylord includes a gain control unit(figure 2, 250, figure 3, column 4, line 59 through column 5, line 11) that includes gain profiles containing predetermined signal values. When the actual values are not as strong as the predetermined values(i.e. a negative error), "the image signal processor amplifies the selected image signals of the

charge image(i.e. actual values) to an amplification level specified by the gain profile(i.e. predetermined values)" column 5, lines 8-10).

Therefore it would have been obvious to a person having ordinary skill in the art at the time of the invention to use the gain control unit as taught by Gaylord in the subregions of the combined invention of Nagano and Canini in order to improve the quality of the charge image and overcome the problem of obtaining a signal that does not fall within the defined exposure range(Gaylord, column 1, lines 39-44).

Consider claims 14 and 18, and as applied to claims 13 and 17 above, the combined invention of Nagano and Canini teaches of a system controller(see claim 1 rationale), and of dividing the pixel area into main and subregions(see claim 1 rationale). The combined invention of Nagano and Canini also teaches of detecting an amount of sensitivity error, and correcting that error(see claim 4 rationale).

However, the combined invention of Nagano and Canini does not explicitly teach that the output of each subregion is amplified in order to correct an amount of negative error.

Gaylord teaches that the image signals are amplified in order to correct an amount of negative error(figure 8, column 6, line 66 through column 7, line 30. Gaylord teaches that an under-exposed area(i.e. a negative error) is amplified to a level corresponding to a gain profile, which indicates a level of desired brightness(i.e. the signal is amplified by the amount of negative error, which is the difference between the current signal and the signal specified by the gain profile)).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Albert H. Cutler whose telephone number is (571)-270-1460. The examiner can normally be reached on Mon-Fri (7:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on (571)-272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AC

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